

INTERROGATION OF MEMBERS OF OKM/4 SKL II ON(a) SOLUBLE PRINTING INKS

AND

(b) GERMAN--JAPANESE COMMUNICATIONS

Attached are reports of interrogations carried out at the OKM Signals School, FLENSBURG, on 16th and 20th to 23rd June 1945, of

Kapitaen zur See LUCAN
Kapitaen zur See BEGEMANN
Amtsrat PITZER

all of OKM/4 SKL II, the section responsible for the production and Security of German Naval systems.

TICOM

4 July 1945

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Subjects:-- Kapitän zur See Lucan) OK
 Kapitän zur See Begemann) 4SKL II

Present: Cdr. Dudley Smith, R.N.
 Lt. Cdr. Davenport, R.N.V.R.
 Lt. Cdr. Forster, R.N.V.R.

Q: When did you begin work on the development of soluble inks?

B: 1939. By January 1, 40 we had produced the first documents using soluble ink.

Q: Which sub-section of 4SKL II dealt with this subject?

B: I was personally responsible for the development of soluble inks assisted by three other officers of 4SKL II. We conducted negotiations with various firms and with the National Printing Office [Reichsdruckerei] in Berlin. We also had a method of producing documents of this kind on a typewriter.

Q: Did you use soluble paper in addition to soluble ink?

B: The primary object was to produce and use a soluble ink. Various types of paper were tried, and it was eventually found that the ordinary rough paper used by the printers for protecting freshly printed sheets was the most suitable. This paper eventually disintegrated in water, but although this was an obvious advantage it was quite a coincidence and was not a factor which led to the selection of this particular paper. Similarly, there was nothing significant in the fact that a pink paper was used in conjunction with a red ink.

Q: Was this paper specially treated in any way?

B: No, not at first, but about 6 months after its first introduction we began to print on the paper using a colourless ink which produced an effect similar to a water mark so that when the real text began to dissolve the underlying text would come up to confuse any subsequent attempt at interpretation.

Q: Did you use rubber or metal type?

B: Rubber. At first we used a stencil instead of typing direct, as the National Printing Office were unwilling to undertake this type of work since it was somewhat laborious. We began to use rubber type at the end of 1940. [K.Z.S. Begemann was uncertain of the exact date, but said that the 'Schlüssel M Anleitung' and some 'R.H.V.' documents were the first to be printed with rubber type. He also mentioned the 'O.S.H.' in this connexion, but the reference was vague and interrogators were unable to press for it.] Our first request for a soluble ink was made to the National Printing Office, but they were unable to produce any satisfactory solution to the problem. We therefore approached the firm of Günther Wagner of Hanover. They produced two samples, one green, and one red. They also produced a white parchment paper for use with the green ink. Although used for a few documents in the early stages, the green ink was found unsuitable and its use was dropped since it dried slowly, was too thin, and smudged readily.

We considered it unsound to be in the hands of one firm and samples of both the red and green inks were sent to the National Printing Office. [The tone of his remarks here indicated that it was hoped this would shame them into action since the N.P.O. had been unable to produce a satisfactory ink when at first asked].

The National Printing Office then produced a red ink of their own, which was the ink used in all subsequent work.

Q: Can you give the formula of this ink?

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give the formula to OKW they gave only an evasive answer. I do not know whether they eventually passed the formula to OKW.

- Q: Who was responsible for the work in the National Printing Office?
B: Reg. Rat. Hoffmann. The red ink was investigated by Naval chemists who pronounced it satisfactory. I do not know whether they found the formula.
- Q: Are any specimens of the ink available?
B: It was the duty of the chemists to test the ink from time to time. There should therefore be plenty about as this ink was used for typing as well.
- Q: Describe the method of use.
B: The reproduction apparatus used was a common commercial article slightly modified by the use of rubber rollers to prevent the ink soaking into the roller. [He gave a brief description of the method of use and made a rough sketch].
- Q: Is such a machine available in Flensburg?
L: They did have one. Amtsrat Pitzer would be the man to ask. [Note: Pitzer was interrogated by Lt. Nuelsen, U.S.N.R. on the following day, and two machines were obtained intact together with supplies of ink. Pitzer gave detailed written instructions for the use of the apparatus, which together with the ink is being brought to U.K.]
- Q: What paper was used?
B: The pink paper was used for all purposes, and there was an instruction that it should be used. This paper could only be had from the National Printing Office and always had the "dummy" invisible print on it. If any other paper was ever used, it was against my instructions.
- Q: Do you know the name of the individual in the firm of Günther Wagner most concerned with the development of soluble inks?
B: No, I do not remember it, though the chemical people might.
- Q: Were the firm's premises destroyed during the bombing of Hanover?
B: I do not know but in any case the whole work was handed over to the National Printing Office in 1940.
- Q: Did you have any liaison with the Japanese on this subject?
B: I was visited by Japanese officers, and they were shown both the ink and the apparatus. They did not show any great interest in this subject.
- Q: Were they given any samples of the ink?
B: No, the Japanese were not given samples either of ink or documents.
- Q: Were any tests carried out to determine whether it would be possible to recover the text?
B: Some tests were made at the beginning but without success. My department had no laboratory of its own, and the material was passed to the Chemical and Physical Research Establishment of the Navy [C.P.V.A.].
- Q: We have been told that the Italians carried out tests and succeeded in recovering the text. Do you know anything of this?
B: No, I have never heard of any experimental work by the Italians.

The interrogation continued on joint German-Japanese cypher systems. The following points emerged:

1. German-Japanese intercommunication was regulated by the "Deutsch-Japanisches Nachrichtenabkommen" [German-Japanese Communications Agreement] of 1942.
2. Occasions for its application arose very seldom in practice. The only case Kapt. Z.S. Begemann could remember concerned Japanese U-boats in European waters.

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3. Provision was made for three systems:

- a. 'Sumatra': cryptographically of Japanese type, consisting of transposition and substitution with several alphabets.
- b. 'Togo': Enemy Reporting Code [Aufklärungskode] giving positions etc. It consisted of a three letter book. There was a German edition, which was the original, and a Japanese translation.
- c. 'Tirpitz' or 'Schlüsselmaschine 'T': a commercial type enigma with no Steckers and 8 wheels. About 300 of these machines had been supplied, but it was thought that few of them ever reached the Far East. The machine was made at the request of the Japanese; it did not embody any new features but was made up of existing parts.

4. The language used with 'Sumatra' and 'Tirpitz' was English or German. Kapt. Z.S. Bogemann remembered a case of a Japanese U-boat sending messages on one of these systems in Romaji Japanese with internal address 'Kaigun Berlin'; these messages were decyphered at Nordleich and sent to the Japanese Embassy.

5. There was no mention of the use of the International Signal Book, either plain or recyphered with 'Sumatra' or 'Tirpitz'.

OKM Signal School, Flensburg. 20th-23rd June, 1945

Subject: Amtsrat PITZER, 4 SKL IIcc.

Present: Lt. Cdr. FORSTER, R.N.V.R.
Lieut. NUELSEN, U.S.N.R.

The following points emerged:

1. The soluble ink as normally used was the invention of Dr. Hoffmann of the Reichsdruckerei [National Printing Office]. The Reichsdruckerei was the sole manufacturer of the ink. Only Dr. Hoffmann knew the formula.
2. Rubber type (Weichgummi, not Hartgummi or any form of plastic) had been introduced in 1940, since when there had been no essential change in the system. [Comment: a categorical statement to this effect was obtained.] Metal type had first been used, but the special ink had caked it up, and it could not be cleaned off with the usual appliances. In 1945 the Reichsdruckerei was still using rubber type, as Pitzer remembered them complaining of the rubber shortage at that time.
3. The paper used was ordinary waste [Makulaturpapier] as used in printing houses. Its suitability was discovered by chance. There was no significance in the colour. The colour was not obtained by dipping the paper in the ink.
4. The system was submitted to the Abwehr for testing, and a Dr. Hähnle of the Abwehr developed a reagent called 'Tinktur A' which caused washed out text to appear again for approx. 10 minutes, after which it disappeared for good. Pitzer was given a bottle of this preparation so that he could carry out tests for himself. It was lost when the O.K.W. building in Berlin was bombed. The description he gave of 'Tinktur A' was: a coffee coloured thin brown watery fluid, tasting of iodine and smelling of sulphur. He had been recommended to apply it in one direction only, and had been told that the factor which enabled it to make the text legible again was the deformation of the fibres of the paper caused by the impression of the text.
5. The success of this preparation was such that the Abwehr suggested that some form of 'Unterdruck' [subterposed text] be employed in order to confuse the recovery.
6. This was done by pre-printing a dummy text in colourless ink on every sheet of paper. When 'Tinktur A' was used to recover a text printed on this sort of paper, the dummy text came up as strongly as the genuine or stronger, thus making it very difficult to read the real text. This was first done in Summer 1940 to Spring 1941.
7. The ink could also be used for stencil work of the ordinary Gestetner type. The ink used was the same as that used for printing. Pitzer handed to us several bottles of ink and two specimens of the machines, pointing out that their special feature was that they had aluminum rollers. These machines were held by Shore Commands e.g. M.O.K.s, F.d.U. West, B.d.U., Ital F.d.U. etc., thirteen to fifteen in all. One stencil would do 17,000 copies if carefully handled.

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8. There was no difference in the use of 'Tinktur A' according to whether the text was printed or stencilled.
9. He confirmed the statement of Kapt. Z.S. Begemann on the early stages of trials with the ink. At first they tried an ink made by Günther Wegner of Hannover, either green or red, which was used with a parchment-like paper. This was unsatisfactory - it stuck to the type and dissolved in damp. Rice paper was never used.
10. The final red product was also soluble in fine oil - Knochenöl. No tests with fuel oil were done. The ink did not dissolve on singed paper.
11. As far as he is aware the formula was never given to the Japanese. The Japanese received a set of instructions for the use of the 'T' machine which were printed in this ink, but they were never given any details of its manufacture.
12. Pitzer was very firm on the destruction of all back cypher material. 4 SKL II had cut down very much on their records during their various moves and at the end (since May) only kept back keys for one month. These were all destroyed. [Note: No reason to believe that Pitzer is not telling the truth.] The keys were compiled by Ob. Insp. Lier [not available].
13. Pitzer handed us a copy of the draft of a new hand cypher for U-Boats.
14. Pitzer confirmed the opinion of Kapt. Z.S. Begemann that very few 'T' machines had ever reached Japan. The Japanese could of course obtain 'Schlüssel 1' from German Naval authorities in the Far East, but even so the number would be very small.